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that the cross sections of any two muscles tending to produce a similar effect are directly proportional to the cross sections of their tendons.

I shall select as an example the case of the *flexor hallucis longus* and *flexor digitorum communis perforans* of the Rhea, whose tendons unite into a common tendon halfway down the posterior side of the *cannoneon* bone of the bird.

The cross sections of these two muscles are shown in the annexed figures, taken as in the human subject. (Figs. 7 and 8.)

The areas of these cross sections were found to be as 245 to 160; or the lesser was 65 per cent. of the greater.

Two equal lengths of the dried tendons were then weighed and found to be in the proportion of 845 to 495, which was assumed to be the proportion of their cross sections. The lesser of these numbers is 59 per cent. of the greater; a result that seems to be as near to the former result derived from the muscles, as can be expected in this class of experiments.

#### IV. "Observations on the Anatomy of the Thyroid Body in Man."

By GEORGE W. CALLENDER, Lecturer on Anatomy at St. Bartholomew's Hospital. Communicated by Mr. PAGET, Received June 8, 1867.

##### (Abstract.)

Much doubt exists as to the earliest connexions of the thyroid body, whether it is developed, that is to say, with the membranous air-tube, or has a common origin with the thymus gland. There are no reliable observations as to the formation of the isthmus or as to the origin of the pyramid, so far, at least, as man is concerned, although, with reference to the isthmus, its absence in an entire class, that of birds, and the observations of Gray on the formation of the thyroid in the chick, countenance the supposition that it results from the growing together of two lateral masses.

In a human foetus, between the seventh and eighth week, the thyroid body is closely connected with the trachea and with the lower edge of the larynx, and although consisting of but one piece is deeply notched, and thus looks as though made up of three separate lobes. It is quite distinct from the thymus, as may be further seen in the dissection of a foetal rabbit or foetal pig, in which, whilst firmly attached to the trachea, it has no kind of connexion with the thymus. In the human foetus no distinct evidence of the thyroid appears to exist before the sixth week, up to which time it cannot, I believe, be isolated from the structures in front of the neck. It seems to come out from the blastema in the form of a mass in front of the trachea, and quickly acquires an imperfectly lobed appearance.

In the dissections referred to, the presence of a middle portion and its

equal development with the lateral lobes lead to the inference that this central part is present from the earliest period, and that the thyroid isthmus is not formed by a growing together of two distinct sidepieces. In examining the thyroid in foetal dogs, cats, and hares, I have always found the middle portion equally developed with the side lobes, and bounded by notches which seem to define it from them. With the growth of the fetus the central part appears to flatten, losing the rounded, lobular condition, and sometimes disappears. The isthmus is formed from the smaller, middle, division uniting the other two; but there may be an absence of isthmus through failure of this union, the middle portion joining the right or left lobe, or a small middle lobe may remain distinct from the other two. The pyramid is very commonly met with in the fetus, and is clearly an outlying part of the body, sometimes represented by bud-like projections, sometimes consisting of a process which reaches to the hyoid bone. It is probable that these outgrowths from the foetal thyroid often shrink and disappear with advancing years.

The dissections of the human fetus lead to the following conclusions:—(1) The thyroid is developed in connexion with the air-tube, and has no relation with the thymus. (2) It does not consist of two separate lateral masses, and the isthmus is present from the first as a distinct central portion. (3) The pyramid is an outlying part of the body, presenting, during foetal life, all possible variations as to shape and site.

V. “On the Physical Constitution of the Sun and Stars.” By G. JOHNSTONE STONEY, M.A., F.R.S., F.R.A.S., Secretary to the Queen’s University in Ireland. Received May 15, 1867.

(Abstract.)

An attempt is made in the memoir of which this is an abstract to take advantage of the insight we have gained within the last few years into the molecular constitution of gases, and the laws which regulate the exchanges of heat that take place between bodies placed in presence of one another, and to apply these new materials to the interpretation of the phenomena of the photosphere of the sun, the appearances presented during total eclipses, and the information about both sun and stars given by the spectroscope.

In an inquiry like this, where we are obliged to put up with such proofs as the materials at our disposal can supply, we must be content to accept results of every variety of probability, from that degree, bordering upon certainty, which commands an unhesitating assent, to that of which the chief scientific value is that it prompts to further investigation and points out a path. Those who read the memoir itself will best judge of the probability of each conclusion from the proofs laid before them; but in this sketch of its contents it may not be useless to indicate what is the value put upon